310 CMR 42.00: CERTIFICATION AND OPERATION OF ENVIRONMENTAL ANALYSIS LABORATORIES

Section

42.01: Purpose

310 CMR 42.00 establishes a program for Department certification of laboratories to conduct analytical measurements for purposes of determining compliance with Department standards where the Department requires that such measurements be conducted by a certified laboratory. Nothing in 310 CMR 42.00 shall prevent laboratories not certified by the Department from conducting analytical measurements for other purposes.

42.02: Authority

310 CMR 42.00 is promulgated by the Commissioner of the Department of Environmental Protection pursuant to authority conferred by M.G.L. c. 21, ' 27, M.G.L. c. 21A, ' 2(28), M.G.L. c. 21C, ' 4, M.G.L. c. 21E, ' 3, M.G.L. c. 111, ' ' 142A through 142E, 150A and 160.

42.03: Definitions

As used in 310 CMR 42.00, the following terms shall have the meanings stated:

Analyst means a chemist, microbiologist or technician who actually performs a test.

Analytical Batch means a group of samples which behave similarly with respect to the testing procedures being employed and which are processed as a unit. For quality control purposes, if the number of samples in a group is greater than 20, then each group of 20 samples or less will all be handled as a separate batch.

Category means an analyte or group of analytes for which certification is offered.

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Certified Thermometer means a thermometer which has documentation showing that it has been compared against a National Institute of Standards and Technology thermometer for the temperature range in which it is to be used.

Certification Officer means the person or persons designated by the Department to inspect and evaluate environmental laboratories for compliance in meeting the criteria set forth in 310 CMR 42.00.

Check Standard means a solution of one or more analytes which is used to check laboratory performance. It is prepared from a source of reagents different from those used to prepare the stock standards and primary dilution standard solutions.

Department means the Department of Environmental Protection of the Commonwealth of Massachusetts.

EPA means the United States Environmental Protection Agency.

Field Reagent Blank means reagent water or analyte-free solvent placed in a sample container in the laboratory,taken to the sampling site and returned to the laboratory unopened. It is treated as a sample in all respects, including exposure to sampling site conditions, storage, preservation and all analytical procedures.

Instrumentation Analyst means an analyst who operates an instrument such as an atomic absorption spectrophotometer, ion chromatograph, gas chromatograph, liquid chromatograph, gas chromatograph/mass spectrometer (GC/MS), or inductively coupled plasma-atomic emission spectrometer (ICP).

Laboratory Fortified Blank means an aliquot of reagent water to which known quantities of the method analytes are added in the laboratory. The laboratory fortified blank is analyzed exactly as a sample. Its purpose is to determine whether the methodology is in control, and whether the laboratory is capable of making accurate measurements at the required method detection limit.

Laboratory Fortified Sample Matrix means an aliquot of an environmental sample to which known quantities of the method analytes are added in the laboratory. The laboratory fortified sample matrix is analyzed exactly as a sample. Its purpose is to determine whether the sample matrix contributes bias to the analytical results. The background concentrations of the analytes in the sample matrix must be determined in a separate aliquot and the measured values in the laboratory fortified sample matrix corrected by background concentrations.

Laboratory Reagent Blank means an aliquot of reagent water that is treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, internal standards, and surrogates that are used with other samples. The laboratory reagent blank is used to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

Method Detection Limit means the minimum concentration of substance that can be identified, measured, and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte. The method detection limit refers to samples which have been processed through all the steps of an established analytical procedure.

MMO-MUG Test means the Minimal Medium ONPG-MUG test for the rapid and simultaneous detection of total coliform and Escherichia coli.

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Performance Evaluation Samples mean samples which contain known amounts of analytes and are obtained from the Department or from a third party acceptable to the Department. The composition of the sample is unknown to the laboratory performing the analysis. The performance evaluation sample is used to evaluate the ability of the laboratory and of the individual analyst to produce accurate and precise results.

Person means an individual, corporation, company, association, trust, partnership, the Commonwealth, a municipality, district or other subdivision or body politic of the Commonwealth, and any department, agency or instrumentality of the United States.

Primary Dilution Standard Solution means a solution of several analytes prepared in the laboratory from stock standard solutions and diluted as needed to prepare calibration solutions and other needed analyte solutions.

Proficiency Testing means a program in which performance evaluation samples are used to evaluate the analytical performance of a laboratory.

Stock Standard Solution means a concentrated solution containing a single certified standard that is a method analyte, or a concentrated solution of a single analyte prepared in the laboratory with an assayed reference compound.

Surrogate Analyte means a pure analyte(s), which is extremely unlikely to be found in any sample, and which is added to a sample aliquot in known amount(s) before extraction and is measured with the same procedures used to measure other sample components.

42.04: Application Procedure

(1) Filing. An initial application for certification in one or more matrices, disciplines or categories shall be submitted on forms provided by the Department. The application form must be fully completed before filing with the Department. Incomplete applications will not be accepted.

(2) On-Site Inspection. The applicant must submit to an on-site inspection of the laboratory to enable the Department to determine whether the laboratory satisfies the Department's standards for certification.

(3) Proficiency Testing. The applicant must satisfactorily analyze samples from a proficiency testing program approved by the Department for the matrices, disciplines and categories for which certification is sought.

(Application and Certification Fees. Reserved)

42.05: Certification Matrices, Disciplines and Categories

The Department shall certify qualified applicants in one or more of the following matrices, disciplines and categories:

(1) Potable Water. Certification in this matrix applies to analyses of drinking water supplies for purposes of determining compliance with 310 CMR 22.00: *Drinking Water Regulations*. Certification in this matrix may be obtained in any or all of the following disciplines and categories:

(a) Microbiology. Certification in this discipline may be obtained in any or all of the following categories:

1. Total Coliform by the Membrane Filter Method;
2. Total Coliform by the Fermentation Tube Method;
3. Total Coliform by the Presence/Absence Test;
4. Total Coliform by the MMO-MUG Test;

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5. Fecal Coliform by the Membrane Filter Method;
6. Fecal Coliform by the 10 tube Fermentation Tube Method; and
7. Heterotrophic Plate Count.

(b) Chemistry. Certification in this discipline may be obtained in any or all of the following categories:

1. Metals:
   a. Antimony;
   b. Arsenic;
   c. Barium;
   d. Beryllium;
   e. Cadmium;
   f. Chromium;
   g. Copper;
   h. Lead;
   i. Mercury;
   j. Nickel;
   k. Selenium;
   l. Silver;
   m. Thallium;
2. Nitrate-N;
3. Nitrite-N;
4. Fluoride;
5. Sodium;
6. Sulfate;
7. Cyanide;
8. Turbidity;
9. Residual Free Chlorine;
10. Corrosivity Series (Calcium, total alkalinity, total dissolved solids, pH, temperature, Langlier Index);
11. Polychlorinated biphenyls;
12. Herbicides:
    a. 2,4-D;
    b. 2,4,5-TP;
    c. Dalapon;
    d. Dinoseb;
    e. Pentachlorophenol;
    f. Picloram;
13. Pesticides:
    a. Alachlor;
    b. Atrazine;
    c. Chlordane;
    d. Endrin;
    e. Heptachlor;
    f. Heptachlor Epoxide;
    g. Hexachlorobenzene;
    h. Hexachlorocyclopentadiene;
    i. Lindane;
    j. Methoxychlor;
    k. Simazine;
    l. Toxaphene;
14. Carbamates:
    a. Aldicarb;
    b. Aldicarb sulfone;
    c. Aldicarb sulfoxide;
    d. Carbofuran;
    e. Vydate;

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15. Polynuclear Aromatic Hydrocarbons;
16. Adipates/Phthalates;
17. Trihalomethanes;
18. Volatile Organics;
19. 1,2-Dibromo-3-chloropropane and 1,2-Dibromoethane.
20. Asbestos
21. Diquat
22. Endothall
23. Glyphosate
24. Haloacetic Acids
25. Bromate
26. Chlorite

(c) Radiochemistry. Certification in this discipline may be obtained in any or all of the following categories:

1. Gross Alpha;
2. Gross Beta;
3. Strontium-89;
4. Strontium-90;
5. Radium-226;
6. Radium-228;
7. Tritium;
8. Uranium;
9. Iodine-131;
10. Cesium-134;
11. Cesium-137;
12. Cobalt-60;
13. Ruthenium-106.

(2) Non-Potable Water. Certification in this matrix applies to analyses of water conducted for purposes other than for purposes of determining compliance with 310 CMR 22.00: *Drinking Water Regulations*. Certification in this matrix may be obtained in any or all of the following disciplines and categories:

(a) Microbiology. Certification in this discipline may be obtained in any or all of the following categories:

1. Total Coliform by the Membrane Filter Method;
2. Total Coliform by the Fermentation Tube Method;
3. Fecal Coliform by the Membrane Filter Method;
4. Fecal Coliform by the Fermentation Tube Method; and
5. Heterotrophic Plate Count.

(b) Chemestry. Certification in this discipline may be obtained in any or all of the following categories:

1. Metals:
    a. Aluminum;
    b. Antimony;
    c. Arsenic;
    d. Beryllium;
    e. Cadmium;
    f. Chromium;
    g. Cobalt;
    h. Copper;
    i. Iron:
    j. Lead;
    k. Manganese;
    l. Mercury;
    m. Molybdenum;
    n. Nickel;
    o. Selenium;
    p. Strontium;
    q. Thallium;
    r. Vanadium;
    s. Zinc;

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2. Minerals:
   a. pH;
   b. Specific Conductivity;
   c. Total Dissolved Solids;
   d. Total Hardness (as Calcium Carbonate);
   e. Calcium;
   f. Magnesium;
   g. Sodium;
   h Potassium;
   i. Total Alkalinity (as Calcium Carbonate);
   j. Chloride;
   k. Fluoride;
   l. Sulfate;
3. Nutrients:
   a. Ammonia-N;
   b. Nitrate-N;
   c. Kjeldahl-N
   d. Orthophosphate;
   e. Total Phosphorus;
4. Demand:
   a. Chemical Oxygen Demand;
   b. Biochemical Oxygen Demand;
   c. Total Organic Carbon;
5. Total Cyanide;
6. Non-Filterable Residue (Total Suspended Solids);
7. Total Residual Chlorine;
8. Oil and Grease;
9. Total Phenolics;
10 Volatile Organics;
   a. Volatile Halocarbons;
   b. Volatile Aromatics;
11. Peaticides:
   a. Chlordane
   b. Aldrin;
   c. Dieldrin;
   d. DDD;
   e. DDE;
   f. DDT;
   g. Heptachlor;
   h. Heptachlor Epoxide;
12. Polychlorinated Biphenyls (water);
13. Polychlorinated Biphenyls (oil).

(Hazardous Wastes and Materials and Solid Wastes. Reserved)

(Air. Reserved)

42.06: Laboratory Rating Scheme

After the Department's on-site inspection and review of proficiency test results, the Department shall classify the laboratory by matrix, discipline and category according to the following rating scheme:

(1) Certified - the laboratory meets the Department's minimum requirements for certification and is deemed capable of producing valid data;

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(2) Provisionally certified - the Department deems the laboratory capable of producing valid data despite minor deficiencies;

(3) Not certified - the laboratory fails to meet the Department's minimum requirements for certification and is deemed incapable of consistently producing valid data.

42.07: Criteria for Certification

(1) Proficiency Testing. Satisfactory performance in the proficiency testing program is accomplished when the analytes in a category are correctly identified and acceptably quantified. Criteria for acceptability shall be set by the Department for each analyte in each discipline and category. Continued unsatisfactory performance in the analysis of an analyte within a category may result in revocation of certification for that analyte.

(2) On-site Inspections.

(a) The Department shall conduct an on-site inspection of each laboratory seeking certification to determine whether or not the laboratory meets the Department's standards for performing analyses in the matrices, disciplines and categories for which certification is sought.

(b) The Department shall consider the following factors in determining whether to certify a laboratory:

1. education and experience of laboratory personnel;
2. adequacy of laboratory facilities and equipment;
3. adherence to Department approved methodology and quality assurance/quality control procedures;
4. adherence to Department approved methods of handling and reporting data;
5. adequacy of safety equipment and training; and
6. any other factors the Department deems relevant to the determination of the ability of a laboratory to operate in a professional manner.

(c) Following an on-site inspection, the Department shall furnish the laboratory with a written report describing any deficiencies found during the on-site inspection and any corrective actions the laboratory must take to be certified. The laboratory shall have 90 days from the date of issuance of the Department's report to take the necessary corrective actions. A laboratory not taking corrective action within that period shall be required to submit a new application to receive certification.

42.08: Minimum Standards for Certification

(1) Personnel. Certified laboratories and laboratories seeking certification shall designate a laboratory director and laboratory supervisor(s), and employ a sufficient number of qualified analysts commensurate with the laboratory's workload. The designated laboratory director and laboratory supervisor may be the same individual if he or she possesses the minimum qualifications and fulfills the responsibilities of both positions as set in 310 CMR 42.08(1).

(a) The laboratory director shall have the following responsibilities:

1. developing policies, programs, and standard operating procedures that will ensure accurate and objective analytical results;
2. employing and ensuring the training of qualified laboratory personnel;
3. reporting analytical results to the Department in accordance with 310 CMR 42.13;
4. interpreting and evaluating reports of analyses submitted by the laboratory upon request of the Department.

(b) A laboratory supervisor shall have the following responsibilities:

1. performing analyses and/or providing personal and direct supervision and training to laboratory analysts performing analyses in the categories for which the supervisor is qualified;

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2. instruction and general supervision of all other laboratory operations including sample tracking, data validation, quality control, verification, and prompt reporting of results; and

3. acceptance and nonacceptance of samples submitted to the laboratory for analysis.

(c) Minimum Qualifications of Laboratory Director.

1. Academic Training. The laboratory director shall possess a Bachelor's degree in biology, chemistry, or a closely related field. If chemical analyses are to be performed by the laboratory, the director must have at least 24 college credits in chemistry.

2. Experience. The laboratory director shall have a minimum of three years of experience in an environmental analysis laboratory.

(d) Minimum Qualifications of Laboratory Supervisor for Laboratories Certified in the Discipline of Chemistry.

1. Academic Training. The laboratory supervisor shall possess a Bachelor's degree in chemistry, biology, or a closely related field, and have at least 30 college credits in chemistry.

2. Experience.

a. Inorganic Chemistry. Minimum of two years laboratory experience in chemical analysis.

i. Inorganic Chemistry - including Atomic Absorption Spectroscopy. The laboratory supervisor shall have a minimum of two years laboratory experience in chemical analysis, including six months training or experience in the operation of an atomic absorption spectrophotometer.

ii. Inorganic Chemistry - including Inductively Coupled Plasma (ICP) methods. The laboratory supervisor shall have a minimum of two years laboratory experience in chemical analysis, including one year training or experience in Inductively Coupled Plasma methods.

b. Organic Chemistry. The laboratory supervisor shall have a minimum of two years laboratory experience in chemical analysis.

i. Organic Chemistry - including gas chromatography methods. The laboratory supervisor shall have a minimum of two years experience in chemical analysis, including six months training or experience in the operation of a gas chromatograph.

ii. Organic Chemistry - including gas chromatography/mass spectroscopy (GC/MS) methods. The laboratory supervisor shall have a minimum of two years laboratory experience in chemical analysis, including six months training or experience in gas chromatography methods and one year training or experience in the operation of a gas chromatograph/mass spectrometer.

(e) Minimum Qualifications of Laboratory Supervisor for Laboratories Certified in the Discipline of Microbiology.

1. Academic Training. The laboratory supervisor shall have a minimum of a Bachelor's degree in biology, chemistry, or a closely related field with at least four college credits in microbiology.

2. Experience. The laboratory supervisor shall have a minimum of one year of experience in the microbiological methods for which the laboratory is certified.

3. Department microbiologists may be available as consultants for those laboratories owned and/or operated by agencies or political subdivisions of the Commonwealth which are certified only for microbiological analyses, which employ no supervisor and which employ no more than two analysts.

(f) Minimum Qualifications of Instrumentation Analyst.

1. Academic Training. An instrumentation analyst shall possess a minimum of a high school diploma or equivalent and eight college credits in chemistry.

2. Experience. An instrumentation analyst shall have a minimum of six months training or experience in the operation of the appropriate instrumentation except for GC/MS or ICP. One year of training or experience is required for the operation of GC/MS or ICP.

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(g) Minimum Qualifications of Analyst.

1. Academic Training. An analyst shall possess a minimum of a high school diploma or equivalent.

2. Training. An analyst shall receive specialized training in the methods to be performed.

(h) The Department may exempt a laboratory holding certification status on the effective date of 310 CMR 42.00 from one or more of the requirements set forth in 310 CMR 42.08(1), if the Department finds that strict compliance with such requirements would result in an undue hardship and would not serve to further the intent of 310 CMR 42.00. An exemption, when granted, shall be effective for not more than one year unless renewed by the Department.

(2) Facilities.

(a) A certified laboratory shall have adequate space in which to perform the analyses and related activities in the disciplines and categories in which it is certified.

(b) The laboratory work bench area shall be well-lighted and of ample size. It shall be convenient to a sink, hot and cold running water, gas, suction and electrical outlets if necessary.

(c) Aisles between benches shall be clear to provide adequate room for passage of personnel and equipment.

(d) Proper ventilation including exhaust hoods shall be provided for the safe handling of chemicals and samples.

(e) Proper facilities shall be provided for the safe storage of volatile, corrosive and flammable materials.

(f) Temperature and humidity shall be controlled in the laboratory at the levels required for the proper performance of the analyses and for the optimum operation of instruments that are sensitive to variations in temperature.

(g) Certified laboratories shall have a locked facility for storage of chain-of-custody samples.

(3) Equipment. Certified laboratories and laboratories seeking certification shall have readily available on the premises all equipment, supplies, reagents, glassware and instrumentation necessary to perform the analyses for which the laboratory is certified. Such material shall be maintained in good working condition and meet the criteria specified in 310 CMR 42.08(3):

(a) Refrigerator. Aqueous reagents and samples may be stored in a standard household refrigerator. A flammable materials refrigerator shall be used for storage of organics and flammable materials. The internal temperature of a refrigerator shall be maintained at 4EC $\pm$ 2EC. Organics and flammable materials not requiring refrigeration shall be stored in a flammable storage cabinet.

(b) Drying Oven. The drying oven shall have selectable temperature control with a range from room temperature to 180EC $\pm$ 2EC or higher.

(c) Source of Distilled or Deionized Water. Distilled or deionized water shall meet the minimum criteria of the methodologies employed.

(d) Top-loader Balance. The balance pan shall be clean and free of corrosion. The balance must be capable of detecting a weight of 100 mg at a 150 mg load.

(e) Hot Plate. The hot plate shall have selectable temperature controls for safe heating of laboratory reagents.

(f) Magnetic Stirrer. The magnetic stirrer shall be of variable speed with a stirring bar coated with inert material.

(g) Glassware. Glassware shall be made of borosilicate glass. Volumetric glassware shall be marked Class A.

(h) Analytical Balance. The analytical balance shall have a sensitivity of 0.1 mg. It shall be mounted on a stable shock-proof base and protected from interference due to air currents.

(i) Conductivity Meter. The conductivity meter shall be readable in ohms or mhos and have a range from 2 ohms to 2 megohms or equivalent micromhos $\pm$ 1%.

(j) pH Meter. The pH meter shall be accurate to at least $\pm$ 0.05 units and have scale readability to $\pm$ 0.1 units.

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(k) Thermometer. The thermometer shall be of good grade and mercury-filled. It shall have 1EC or finer subdivisions and be calibrated to 180EC or higher. The mercury column shall have no separations. An organic solvent-filled thermometer may be used in a refrigerator.

(l) Water Baths. Water baths may be electric or steam heated and be capable of controlling temperature to 100EC within 5EC.

(m) Incubators. Incubators shall have an internal temperature monitoring device and be capable of maintaining proper temperature.

(n) Autoclave. The autoclave shall be equipped with an accurate thermometer, a separate pressure gauge and an operational safety valve. It shall maintain the sterilization temperature throughout the sterilization cycle and depressurize slowly so that no air bubbles form in inverted tubes and media does not boil over.

(o) Hot-Air Sterilization Oven. Hot-air sterilization ovens shall be capable of maintaining a stable sterilization temperature (170EC - 180EC).

(p) Muffle Furnace. Muffle furnaces shall be capable of heating glassware to 400EC for cleaning.

(q) Spectrophotometer. Spectrophotometers shall have a usable wavelength range of 400 to 700 nm with a maximum spectral band width of no more than 20 nm and wavelength accuracy $\pm$ 2.5 nm. Photometers must be capable of using several sizes and shapes of absorption cells providing a sample path length from approximately 1 to 5 cm.

(r) Atomic Absorption Spectrophotometer. An atomic absorption spectrophotometer shall be a single- or double-beam instrument having a grating monochromator, photomultiplier detector, adjustable slits, and wavelength range of at least 190 to 800 nm. A background correction system, or provision for a subsequent analysis using a non-absorbing line, is required for furnace analysis.

(s) Gas Chromatograph. Gas chromatographs shall have a column oven capable of isothermal temperature control $\pm$ 0.2EC to at least 220EC. It shall also be temperature programmable at rates specified in the employed methodology.

(t) Mass Spectrometer. The mass spectrometer must be capable of scanning the range of masses required by the employed method and it must be capable of achieving all acceptable performance criteria specified in the method. There must be an interfaced data system to acquire, store, reduce, and output mass spectral data.

(u) Inductively Coupled Plasma-Atomic Emission Spectrometer (ICP). The ICP instrument may perform either sequential or simultaneous analyses and must be equipped with background correction. Argon may be either liquid or dry gas.

(4) Safety.

(a) Certified laboratories shall establish and maintain a health and safety program for the protection of laboratory personnel from physical, chemical, and biological hazards. Such a program shall include training of laboratory personnel in the use of fire extinguishers, safety equipment, and protective equipment and clothing.

(b) A laboratory shall have readily available sufficient fire extinguishers with the appropriate rating considering the particular nature of fire hazard in the laboratory. A tag shall be attached to each extinguisher documenting inspection and service dates.

(c) Eye protection, protective clothing, and appropriate respirators shall be readily available for use by laboratory personnel.

(d) Compressed gas cylinders must be securely fastened to prevent dislodging and tipping.

(e) Waste chemicals and solvents shall be stored in appropriate containers and disposed of in accordance with state and federal laws.

(f) Appropriate occupational health and safety laws shall be posted and observed by laboratory personnel.

(5) Quality Assurance/Quality Control.

(a) General Requirements.

1. Certified laboratories shall establish and maintain a written Quality Assurance (QA) policy acceptable to the Department. Each laboratory's QA policy shall be made available to all analysts employed by the laboratory. At a minimum, QA policies shall include:

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a. QA organization and responsibility;
b. QA objectives for precision and accuracy;
c. Standard Operating Procedures;
d. Record Maintenance;

2. Standard Operating Procedures. The standard operating procedures section of a laboratory's QA policy shall include the following:

a. sample custody and storage procedures;
b. calibration procedures and frequencies;
c. analytical procedures, including any modifications to published procedures;
d. data reduction, validation and reporting procedures;
e. internal quality control procedures (type and frequency);
f. provision for performance and system audits;
g. preventive maintenance procedures and schedules;
h. specific procedures for assessing data precision and accuracy;
i. procedures for taking corrective actions;
j. quality assurance reporting procedures; and
k. laboratory safety plans.

Only the laboratory director or supervisor may make changes in standard operating procedures. Such changes shall be effective only when put in writing.

3. Record Maintenance. The record maintenance procedures section of a laboratory's QA policy shall include the procedures for creating, controlling, and maintaining the following records;

a. raw data (laboratory notebooks, instrument printouts, etc.);
b. chain-of-custody records;
c. calculations;
d. quality control data; and
e. reports.

4. Temperature Records.

a. A daily record of the temperature of the drying oven shall be maintained for each day the drying oven is used.

b. The temperature of each refrigerator and incubator shall be recorded either continuously or daily from thermometers immersed in liquid and placed on one of the shelves.

5. Laboratory Chemicals and Reagents. Analytical reagent (AR) grade chemicals are required for analyses, unless otherwise required by the analytical method. In addition, laboratory chemicals and reagents shall meet the following requirements:

a. all chemicals shall be labeled with the date of receipt by the laboratory to prevent the use of outdated reagents;

b. stock and working standard solutions shall be compared with check standards and inspected prior to use for signs of decomposition, such as formation of precipitates, evaporation and/or discoloration;

c. all reagents and standards shall be labeled with identification of the compound, concentration, solvent, date of preparation and the name of the analyst who prepared the solution;

d. preparation of all stock standards and primary dilution standards shall be documented, and the concentration of stock and working calibration standards shall be verified against a primary dilution standard prepared from a source of reagents different from those used to prepare the calibration standards; and

e. the use of the acceptable grade of reagents and compressed gases required by the analytical procedure employed shall be documented.

6. Laboratory Water. Distilled and deionized water used in the laboratory shall meet the requirements for Type II water as defined by the American Society for Testing and Materials. Quality checks shall be made daily and documented. Quality may be verified through use of an on-line monitor or conductivity meter.

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7. Laboratory Glassware. All glassware and sample containers must be cleaned prior to use by washing in a warm detergent solution, followed by thorough rinsing with tap water and several additional rinses using deionized or distilled water. Commercially prepared glassware and sample containers may be used, provided the laboratory documents the source and cleaning procedures utilized. Certain analytical methods may require additional glassware preparation procedures or the maintenance of a separate dedicated set of glassware.

8. Maintenance of Laboratory Instrumentation and Equipment. Analytical instrumentation and equipment shall be maintained in accordance with the manufacturer's instructions, analytical method requirements and good laboratory practices. A bound logbook which documents maintenance procedures shall be maintained for each instrument and piece of equipment.

9. Instrumentation Calibration Requirements.

a. General Requirements.

i. Unless directed otherwise by the analytical method employed, all instruments shall be calibrated prior to analysis using a minimum of a blank and three calibration standards that bracket the expected concentration range.

ii. Unless directed otherwise by the analytical method employed, all instrument calibrations shall be verified through the analysis of a calibration check sample that has been prepared using a source of reagents different from that used to prepare the calibration standards. Unless directed otherwise by the analytical method employed, the calibration check sample shall be analyzed at the beginning and at the conclusion of the analysis session and after every 20 or fewer samples. If the result does not agree within 20% of the original value, corrective action shall be taken.

iii. Instrument calibration procedures shall be documented in a bound logbook.

b. Analytical Balance. Each analytical balance shall be checked and adjusted annually by a qualified service person. The accuracy of each analytical balance shall be checked each day it is to be used using a minimum of two Class "S" weights; one in the gram range, one in the milligram range. The results of accuracy checks, the date performed, and the name of the analyst who performed the check shall be recorded in a logbook which is dedicated to the balance. The balance level shall be checked prior to each use and adjusted if necessary.

c. pH Meters. Each pH meter shall be calibrated daily or prior to each use with two pH buffer standards that bracket the expected value. A further check of the meter shall be made after calibration by setting the meter to pH 7.00 with a buffer standard and, without further adjustment, reading buffer standards of pH 4.00 and 10.00. The actual readings shall be recorded, including the date of performance and the name of the analyst who performed the calibration.

d. Conductivity Meters. Meters equipped with conductivity cells having platinum electrodes shall be checked over the range of interest using at least five concentrations of a standard potassium chloride solution. Conductivity cells not having platinum electrodes shall be checked against a conductivity meter equipped with platinum electrodes. These procedures shall be performed annually and the raw data, cell constant and results recorded.

e. Thermometers. The accuracy of all thermometers used to monitor temperatures shall be verified by comparing the reading of each thermometer with that of a certified thermometer. The accuracy of glass thermometers must be verified annually; metal thermometers must be verified quarterly. The laboratory shall maintain a logbook that includes:

i. the identification number of each thermometer;

ii. the temperature displayed on both the certified thermometer and the thermometer being verified;

iii. any applicable correction factor;

iv. the date each check was performed; and

v. the name of the analyst who performed each check.

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f. On-line monitors and portable equipment. Continuous on-line monitors and portable equipment used in obtaining on-site measurements must be calibrated in accordance with the manufacturer's instructions. The calibration must be verified through analysis of an independent check sample or use of an independent monitoring technique. Verification shall be recorded.

g. Spectrophotometer Wavelength Verification. The wavelength setting of the spectrophotometer shall be checked annually by comparing the wavelength setting to that of colored standards or filters, such as didymium glass. The wavelength observed, date of performance and the name of the analyst who performed the check shall be recorded.

10. Sample Collection, Preservation and Handling.

a. Acceptable procedures, as referenced or defined in current federal regulations shall be utilized for sample collection, handling and preservation.

b. The laboratory may reject the sample if it is not assured of the sample identification or of the validity of the sample collection, handling and preservation procedures.

c. Samples shall be stored in such a way that cross-contamination from other samples, standards or reagents is avoided.

d. The laboratory shall adhere to the holding times prescribed in the analytical methods. The holding time is defined as the period from sample collection to sample analysis.

e. Chain-of-custody information must include:

i. sample number;
ii. sample description;
iii. date and time of sample collection;
iv. specific location of sample collection;
v. name of sample collector and intermediate custodians, if any;
vi. date(s) and time(s) of custody transfer to the laboratory; and
vii. name(s) and signature(s) of the individual(s) receiving the sample.

f. A chain-of-custody form must accompany samples shipped by mail or courier.

g. The laboratory shall maintain a system of internal sample tracking that documents sample custody from the time of receipt at the laboratory to the time of disposal.

11. Analytical Methodology. The laboratory shall utilize acceptable analytical methods, including those published and/or approved by EPA for the matrices and analytes of interest. The acceptable methods shall be those defined or referenced in the current federal regulations.

(b) Additional Requirements for Chemical Laboratories.

1. Quality Control Procedures.

a. The laboratory shall prepare and analyze a laboratory reagent blank, sample duplicate, and laboratory fortified blank for every 20 or fewer samples processed as an analytical batch. An acceptable field reagent blank may replace the laboratory reagent blank. In addition, a laboratory fortified sample matrix shall be run if required by the Department. Corrective action shall be taken if the results of these analyses do not meet acceptance criteria developed within the laboratory according to accepted analytical procedures. The preparation of blanks, laboratory fortified sample matrices and duplicates and the results of their analyses shall be recorded.

b. Each laboratory must establish acceptance limits for precision and accuracy and maintain quality control charts for each of the analytes in the matrices, disciplines and categories in which the laboratory is certified. These limits may not be less stringent than those defined in standard analytical methods or approved by the Department.

c. Certified laboratories shall utilize surrogate analytes as required by the analytical procedure employed. Acceptance limits for surrogate analyte recoveries shall be established by the laboratory. Quality control charts must be maintained for each surrogate.

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d. Certified laboratories shall perform and document all quality control procedures in established analytical protocols.

2. Determination of Method Detection Limit.

a. Each laboratory shall experimentally determine the method detection limit for analysis of each analyte in each matrix in which the laboratory is certified.

b. The procedure used to determine the detection limit shall be documented and be acceptable to the certification officer.

c. Calculations used in determining limits must be available for inspection.

d. Detection limits shall be expressed in appropriate units.

e. The laboratory must achieve the method detection limits required by the applicable regulations.

(c) Additional Requirements for Microbiology Laboratories.

1. Temperature Records.

a. Autoclaves. The date, time, temperature and duration of autoclaving shall be recorderd either continuously or for each sterilization cycle. A list of materials sterilized in each cycle must be maintained and signed by the analyst who performed the work.

b. Incubators. On days when the incubator is in use, the temperature of each incubator must be recorded continuously or at least twice per day, with each reading separated by at least four hours. The thermometer shall be immersed in liquid and placed on one of the shelves in use.

2. Sterility of Rinse/Dilution Water and Sample Bottles.

a. Each batch of laboratory water used for rinsing or dilution must be checked for sterility by adding 20 mL of the water to a 100 mL volume of a non-selective broth, which is then incubated at 35EC $\pm$ 0.5EC for 24 hours and checked for turbidity signifying growth.

b. After sterilization, at least one bottle per batch of sterilized sample bottles shall be checked for sterility by adding approximately 25 mL of sterile non-selective broth media to each bottle. The bottle shall be capped and rotated so that the broth comes in contact with all surfaces and shall be incubated at 35EC $\pm$ 0.5EC for 24 hours prior to checking for growth. Prepared sample bottles from each batch shall not be used unless satisfactory results are obtained from the tested bottle.

3. Residue Testing of Glassware.

a. Inhibitory Residue Test. With the initial use of a detergent or washing product, the rinsing process using distilled or deionized water shall be demonstrated to provide glassware that is free from toxic material based on the use of the Inhibitory Residue Test, as specified in the most recent edition of Standard Methods for the Examination of Water and Wastewater, American Public Health Association, America Water Works Association, Water Pollution Control Federation, Washington D.C.

b. Bromthymol Blue Test. Each batch of clean, dry glassware or plasticware shall be tested for residual alkaline or acid residue using bromthymol blue indicator. If the results of the indicator test are not within the desired color range of light green to dark blue, corrective action shall be taken by re-rinsing, air drying and re-testing.

4. Microbiological Media - Quality Control Measures.

a. Media shall be used by the laboratory in the order in which it is received. The laboratory shall keep records that indicate the kind, amount, date received, and date of opening of bottles of media. Bottles of media shall be discarded six months after opening unless stored in a desiccator, in which case it may be used up to one year after opening. The Department recommends that media be ordered in quantities to last no longer than one year, and that media be ordered in quarter pound multiples rather than one pound bottles in order to keep the supply sealed and protected as long as possible.

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b. When media dispensing apparatus is used, the individual who prepares the media shall check the accuracy of the apparatus with a graduated cylinder at the start of each volume change and periodically throughout extended runs.

c. Records shall be available for inspection on all batches of sterilized media showing lot numbers, date, sterilization time and temperatures, final pH, and the name of the individual who performed the work.

d. Positive and negative cultures, or a natural water with known contaminants, shall be used on each new lot of medium to determine performance compared to a previously acceptable lot of medium.

5. Miscellaneous Quality Control Measures.

a. Dechlorination Sufficiency. At least one bottle per batch of sterilized sample bottles prepared with sodium thiosulfate shall be checked to ensure a sufficient amount of the dechlorinating agent by collecting potable water samples from the laboratory tap and checking for residual chlorine. If residual chlorine is present the remaining bottles in the batch shall not be used unless corrective action is taken.

b. Autoclave Operation Check. Heat sensitive tapes, spore strips or ampules shall be used weekly along with a maximum registering thermometer to verify stabilization temperatures within autoclaves and hot air sterilizing ovens. A complete record of the results of these temperature registering entities shall be maintained.

c. Ultraviolet Sterilization Lamps. Membrane filter assemblies may be exposed to ultra-violet irradiation if bacterial carry-over between individual sample filtrations becomes a problem. Ultraviolet sterilization lamps shall be tested quarterly by exposing agar spread plates containing 200 to 250 microorganisms to the light for two minutes. If such irradiation does not reduce the count of control plates by 99%, the lamps shall be replaced. Cleaning of ultraviolet sterilization lamps shall be done at least monthly by disconnecting the unit and cleaning the lamps with a soft cloth moistened with ethanol.

d. Water Baths. Water baths shall be cleaned at least monthly.

e. Microscopes. The optics and stage of microscopes shall be cleaned with lens paper prior to each use.

6. Membrane Filter Procedure Quality Control Specifics.

a. Only membrane filters recommended for water analysis by the manufacturer shall be used.

b. Lot numbers of membrane filters and date of receipt shall be recorded.

c. Procedural Contamination. A start and finish membrane filtration control test of rinse water, medium and supplies shall be conducted for each filtration series. If sterile controls indicate contamination all data on samples affected shall be rejected and a request made for immediate resampling of those waters affected.

d. Verification of Membrane Filter Colonies.

i. Total Coliform Procedure. All sheen or borderline colonies up to ten on each membrane shall be verified in accordance with the accepted standard procedure contained in the latest edition of Standard Methods for the Examination of Water and Wastewater (Standard Methods).

ii. Fecal Coliform Procedure. Typical blue colonies shall be verified in accordance with the procedure contained in the latest edition of Standard Methods.

iii. Counts shall be adjusted based on verification percentage.

7. Multitube Fermentation Test Quality Control Specifics. When the Most Probable Number (MPN) procedure is employed to determine the bacteriological quality of drinking waters, the completed test, except for gram staining, shall be carried out on 10% of the confirmed coliform positive samples. If no confirmed coliform tubes result from the analysis of potable water samples, at least one source water that yields confirmed tubes shall be carried to completion quarterly.

8. Quality Control and Performance Evaluation Samples.

42.08: continued

a. When quality control samples are available, each approved analyst shall analyze at least one quality control sample per year for the categories to be certified.
b. When unknown performance evaluation samples are available, each approved analyst shall analyze at least one per year for the parameters measured. When performance evaluation results indicate technical error, appropriate corrective action must be taken.
c. If there is more than one analyst in the laboratory, at least once per month each analyst shall perform parallel analyses on at least one positive sample in order to compare performance between analysts.

42.09: Issuance of Certificate

(1) Upon satisfactory fulfillment of the criteria provided herein, the Department shall issue a certificate indicating the laboratory's certification rating for each matrix, discipline and category. The certificate shall be conspicuously displayed at the location stated in the certificate.

(2) Certificates shall be valid for one year unless earlier downgraded or revoked in accordance with 310 CMR 42.12.

(3) Certification status shall apply only to the laboratory located at the address stated in the certificate. Each affiliated or branch laboratory must obtain a separate certificate. Certificates are not transferable or assignable.

In the case of laboratories classified as provisionally certified, the Department may allow the laboratory up to 90 days for correction of deficiencies. The Department may upgrade the status of a provisionally certified laboratory to certified if all deficiencies are corrected prior to the expiration of the provisional certificate which was issued.

42.10: Requirements for Maintaining Certification Status

(1) A laboratory shall satisfactorily analyze samples from a proficiency testing program administered or approved by the Department to maintain certification status.

(2) A laboratory must continue to meet the Department's minimum standards for certification set forth in 310 CMR 42.08 to maintain certification status.

(3) A laboratory shall maintain a current certificate to conduct analytical measurements for purposes of determining compliance with Department standards where the Department requires such measurements to be conducted by a certified laboratory.

42.11: Renewal of Certificate

Filing. A certified laboratory may file an application for renewal of certification on forms provided by the Department up to 90 days prior to the expiration of its certificate. The application for renewal of certification must be fully completed before filing with the Department. Incomplete applications will not be accepted.

(Annual Certification Fee. Reserved)

42.12: Downgrading and Revocation of Certificate

(1) The Department may downgrade or revoke a laboratory's certificate for any of the following reasons:

(a) failure to pass an on-site inspection;

(b) failure to satisfactorily analyze samples from a proficiency testing program approved by the Department;

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(c) failure to comply with any of the requirements specified in 310 CMR 42.00; and
(d) falsification of data or engaging in other deceptive practices.

(2) A laboratory whose certification has been revoked may have certification reinstated through the following procedures:

(a) The Laboratory Director shall submit a written report to the Department detailing the specific corrections that have been made, or that the Director intends to make, in regard to the deficiencies that resulted in revocation of the certificate. This statement of intent shall include a projected completion date on which all deficiencies shall be corrected.

(b) The Laboratory Director shall, at the same time, submit a written request for reinstatement review by the Department. The action taken to correct deficiencies will be observed during this on-site review.

(c) The Department shall determine whether or not deficiencies have been corrected and grant or withhold certification.

(3) A laboratory whose certification has been revoked because of fraudulent practices may not apply for certification for a period of one year following revocation. No analyses by the laboratory in the disciplines or categories in which a laboratory was certified shall be accepted by the Department during any period in which the laboratory has had its certificate revoked.

42.13: Reporting Requirements

(1) No certified or provisionally certified laboratory shall report analytical results to the Department unless the analytical measurements were conducted at the laboratory's address as stated in its certificate.

(2) All reports of analytical data submitted to the Department by a certified laboratory must contain a Quality Assurance/Quality Control Section which includes the following information:

(a) the Massachusetts Laboratory Certification identification number, of each laboratory that performed the analytic measurements;

(b) the analytes measured by each laboratory that performed any of the analyses identified in the report;

(c) the results of analyses of reagent blanks, laboratory fortified blanks, laboratory fortified sample matrices, and duplicates, and surrogate analyte recovery data when requested by the Department;

(d) the analytical methods utilized to detect and quantify the analytes of interest. Sample preparation procedures, if not included in the referenced analytical procedures, must also be referenced or described; and

(e) the date of analysis.

(3) The actual format of the data submitted to the Department is left to the discretion of the laboratory unless otherwise specified. The Department encourages the use of summary tables which allow the reader to easily review and compare the data.

(4) A certified laboratory shall be required to have current knowledge of all Federal and Massachusetts standards for all categories in which it has been certified. Within 24 hours of obtaining valid data, a certified laboratory shall notify its clients of the results of all samples which exceed any established maximum contaminant level or reportable concentration.

(5) A laboratory shall notify the Department in writing upon any change in ownership, laboratory location, personnel, equipment, or any other factor that could impair the analytic capability of the laboratory. Personnel changes must be reported within 30 days and shall be limited to loss or replacement of the Laboratory Director, Laboratory Supervisor, or any other personnel that results in the unavailability of trained and experienced analysts necessary to perform the analyses for which the laboratory has been certified.

42.13: continued

(6) The present owners of a certified or provisionally certified laboratory shall notify the Department of a sale or change in ownership of the laboratory within five days of the same.

(7) The owner of a certified or provisionally certified laboratory seeking to maintain its certification status while changing the laboratory location shall notify the Department in writing at least 30 days prior to any such change. The Department may issue an amended certificate for the new location indicating the laboratory's certification rating for each matrix, discipline and category if it finds that the laboratory meets the Department's criteria for certification.

(8) A laboratory that has been certified by EPA or by its resident state shall notify the Department upon receipt of notice from said EPA or state that its certification has been downgraded or revoked.

(9) All private, non-publicly owned laboratories shall report on the Department approved annual renewal application the total number of samples tested during the prior calendar year in each testing category as specified in 310 CMR 4.10(128).

42.14: Maintenance of Records

(1) Certified laboratories shall maintain copies of all analytical reports, logs, charts and records created in accordance with 310 CMR 42.00 for a minimum of ten years or as otherwise specified by the Department. Records related to performance on proficiency tests shall be maintained for a minimum of two years.

(2) Certified laboratories shall maintain current records of personnel, including a resume documenting education, training, experience, description of duties and dates of relevant employment for each employee.

(3) Certified laboratories shall maintain all records in accordance with the Department-approved QA policy for the laboratory.

42.15: Inspections

All certified and provisionally certified laboratories shall be open for inspection by the Department during business hours.

42.16: Reciprocity

Certificates may be issued in a comparable classification without an on-site inspection to any laboratory which holds a certification from the EPA or from its resident state, if in the opinion of the Department the standards for certification under which such laboratory's certificate was issued are at least as stringent as those set forth in 310 CMR 42.00.

42.17: Hearings

(1) Any person who has been denied certification, or whose certification has been downgraded or revoked, who objects to such action may request a hearing before the Department by filing a written application within ten days of receipt of notice of such action.

(2) Upon receipt of written application, the Department shall establish a time and place for such hearing and inform the petitioner thereof in writing.

(3) At the hearing the petitioner shall be given an opportunity to be heard and to show why the notice should be modified or withdrawn.

(4) After the hearing, the Department shall sustain, modify, or withdraw the notice and shall inform the petitioner in writing of the decision.

42.18: List of Certified Laboratories

The Department shall publish or cause to be published at least annually a list of certified laboratories. This list shall include the name and location of the laboratory, the name of the director, and categories of analysis in which the laboratory has been granted certification. Deletions from and additions to the list shall be available at the designated offices of the Department on a quarter-year basis.

42.19: Potable Water

(1) To receive certification to conduct analyses for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium the laboratory must:

(a) Analyze Performance Evaluation samples which include those substances provided by EPA Environmental Monitoring Systems Laboratory or equivalent samples provided by the Department;

(b) Achieve quantitative results on the analyses that are within the following acceptance limits:

Contaminant	Acceptance Limit
Antimony	$\pm$ 30% at $\geq$ 0.006 mg/l
Asbestos	2 standard deviations based on study statistics
Barium	$\pm$ 15% at $\geq$ 0.15 mg/l
Beryllium	$\pm$ 15% at $\geq$ 0.001 mg/l
Cadmium	$\pm$ 20% at $\geq$ 0.002 mg/l
Chromium	$\pm$ 15% at $\geq$ 0.01 mg/l
Cyanide	$\pm$ 25% at $\geq$ 0.1 mg/l
Fluoride	$\pm$ 10% at 1 to 10 mg/l
Mercury	$\pm$ 30% at $\geq$ 0.0005 mg/l
Nickel	$\pm$ 15% at $\geq$ 0.01 mg/l
Nitrate	$\pm$ 10% at $\geq$ 0.4 mg/l
Nitrite	$\pm$ 15% at $\geq$ 0.4 mg/l
Selenium	$\pm$ 20% at $\geq$ 0.01 mg/l
Thallium	$\pm$ 30% at $\geq$ 0.002 mg/l

(2) To receive certification to conduct analyses for the contaminants in 310 CMR 42.19(2)(b) the laboratory must:

(a) Analyze Performance Evaluation samples which include those substances provided by EPA Environmental Monitoring Systems Laboratory or equivalent samples provided by the Department.

(b) Achieve quantitative results on the analyses that are within the following acceptance limits:

Contaminant	Acceptance Limit (percent)
DBCP	$\pm$ 40
EDB	$\pm$ 40
Alachlor	$\pm$ 45
Atrazine	$\pm$ 45
Benzo[a]pyrene	2 standard deviations
Carbofuran	$\pm$ 45
Chlordane	$\pm$ 45
Dalapon	2 standard deviations
Di(2-ethylehexy)adipate	2 standard deviations
Di(2-ethylehexy)phthalate	2 standard deviations
Dinoseb	2 standard deviations
diwuat	2 standard deviations
Endothall	2 standard deviations
Endrin	$\pm$ 30
Glyphosate	2 standard deviations
Heptachlor	$\pm$ 45

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Heptachlor Epoxide	± 45
Hexachlorobenzene	2 standard deviations
Hexachlorocyclopentadiene	2 standard deviations
Lindane	± 45
Methoxychlor	± 45
Oxamyl(Vgdate)	2 standard deviations
PCBs (as decachlorobiphenyl)	0-200
Piclaram	2 standard deviations
Simazine	2 standard deviations
Toxaphene	± 45
Aldicarb	2 standard deviations
Aldicarb sulfoxide	2 standard deviations
Aldicarb sulfone	2 standard deviations
Pentachlorophenol	± 50
2,3,7,8-TCDD (Dioxin)	2 standard deviations
2,4-D	± 50
2,4,5-TP (Silvex)	± 50

(3) To receive certification to conduct analyses for benzene, carbon tetrachloride, 1,2-dichloroethane, 1,1-dichloroethylene, p-dichlorobenzene, 1,1,1-trichloroethane, trichloroethylene, o-dichlorobenzene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, 1,2-dichloropropane, ethylbenzene, monochlorobenzene, styrene, tetrachloroethylene, toluene and xylenes (total) the laboratory must:

(a) Analyze Performance Evaluation samples which include these substances provided by EPA Environmental Monitoring Systems Laboratory or equivalent samples provided by the Department.

(b) Achieve the quantitative acceptance limits on the analyses performed under 310 CMR 42.19(3)(a) for at least 80% of the regulated organic chemicals listed at 310 CMR 42.19(3).

(c) Achieve quantitative results on the analyses performed under 310 CMR 42.19(3)(a) that are within ± 20% of the actual amount of the substances in the Performance Evaluation sample when the actual amount is greater than or equal to 0.010 mg/l.

(d) Achieve quantitative results on the analyses performed under 310 CMR 42.19(3)(a) that are within ± 40% of the actual amount of the substances in the Performance Evaluation sample when the actual amount is less than 0.010 mg/l.

(e) Achieve a method detection limit of 0.0005 mg/l according to the procedures in Appendix B of 40 CFR Part 136.

(4) To receive certification for vinyl chloride, the laboratory must:

(a) Analyze Performance Evaluation samples provided by EPA Environmental Monitoring Systems Laboratory or equivalent samples provided by the Department.

(b) Achieve quantitative results on the analyses performed under 310 CMR 42.19(4)(a) that are within ± 40% of the actual amount of vinyl chloride in the Performance Evaluation sample.

(c) Achieve a method detection limit of 0.0005 mg/l according to procedures in Appendix B of 40 CFR Part 136.

(d) Obtain certification for the contaminants listed in 310 CMR 42.19(3).

(5) To receive certification for total trihalomethanes, haloacetic acids, bromate, and chlorite the laboratory must:

(a) Analyze Performance Evaluation (PE) samples approved by EPA or the Department.

(b) Achieve quantitative results within the acceptable limit for each analyte included in each PE sample and, for haloacetic acids, on a minimum of 80% of the analytes included in each PE sample. The acceptance limit is defined as the 95% confidence interval calculated around the mean of the PE study data between a maximum acceptance limit of +/- 50% and minimum acceptance limit of +/- 15% of the study mean.

(42.20: Non-Potable Water. Reserved)

(42.21: Hazardous Wastes and Materials and Solid Wastes. Reserved)

(42.22: Air. Reserved)

42.23: Severability

If any provision of 310 CMR 42.00, or its application to any person, is held invalid, such invalidity shall not affect other provisions or applications of 310 CMR 42.00 which can be given effect without the invalid provision or application, and to this end the provisions of 310 CMR 42.00 are declared to be severable.

REGULATORY AUTHORITY

310 CMR 42.00: M.G.L. c. 21, ' 27; ' 21A, ' 2; c. 21C, ' 4; c. 21E, ' 3; c. 111, ' ' 142A through 142E, 150A and 160.

NON-TEXT PAGE